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Aquaculture
in Alberta

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Better Eat "Alberta Trout"

Majestic mountains with splashing crystal clear waters conger up visions of thrashing rainbow, cutthroat and brown trout. This vision brings forth a fish farming instinct in many entrepreneurs. "What a perfect use for my pond on the back forty. I'll just plant it with fish! Now, is the time that the mystery really begins," says Frank Fallwell Chairman, Billingsgate Fish Co. Ltd.

One can only guess the number of times in over 90 years that buyers at Billingsgate Fish Co. Limited in Calgary have been asked the question, "If I grow some fish, will you buy them?" Sometimes as many as three per month, states Fallwell. We could interpret this as a great number of place settings supplied by local fish farms. With all this farming interest, why aren't there thriving fish farms on every water course in the Province of Alberta? First, who is going to buy the fish in the quantities that could be raised? What will those people give up in their diet in order to consume these fish? If I can clean and dress fish, then why can't my customers clean their own fish?

"Now, let me see … three meals per day … four people in a family. We all like fish therefore multiply the number of days per year, times 3,200,000 people in the Province. Wow! This means I can market 1,000,000 fish per year. Let's get started."

Trout farm purists are probably turned off by now with this type of rhetoric. The truth of the matter is that many market consultants do extract their information in a simplistic and straight mathematical manner, without in-depth market analysis. You must know what the retail and food service markets want, what's available in the market today, what the consumption trends are, and just how a backyard fish pond will fit into the scheme of things, on a sustainable basis.

Years ago, it was the Danes and the Japanese who supplied North American markets with frozen rainbow trout. Since the 1950's, the bulk of table trout, fresh and frozen, has come from the Snake River system in Idaho.

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Alberta
AGRICULTURE, FOOD AND
RURAL DEVELOPMENT

Some also came from other States, British Columbia, Saskatchewan and Alberta. Most local trout production seems to have found it's way into fingerling stocking programs for recreational farm dugouts, stocking of select public waters, or private U-catch'em endeavors.

"Large scale trout for the table enterprises have not shown viability in Alberta" states Fallwell. If we have all the natural benefits that lend themselves to raising fish in a fish farm environ-ment, then why has raising table fish not been a very positive experience for the entrepreneur? If you can answer that question, you could be the one successful farmer that everyone is looking to be.

On any given day, a large fish processor / distributor inventories 200 to 250 different species of fish and seafood. In order to be part of those numbers, a fish farmer must admit to several known facts. Fresh fish return more money than frozen, non value added fish. Consistency in the market place creates a market place. Promo-tion, sampling, preparation hints, and pricing incentives all contribute to the consumer wanting to replace their traditional fish diet with trout.

Fish, represent 3-4% of our protein diet when we include red, white and poultry meats. Just getting a place on the plate is a challenge. Flesh color requirements for the food service or restaurant use also have a bearing on the marketability. When only so much fresh trout can be consumed, the value added component can be a market relief for non conforming and surplus fish. Hot and cold smoking, pickling, canning, paté, and stuffing are all possible market forms that have potential. However, these prospects take a great amount of money, promotion and time to be a viable market presence.

The rainbow trout marketplace will be a very interesting farming challenge into the future. From a marketing standpoint, it has never been in a better situation. We have new varieties of fish being raised, with the industry under support of Alberta Agriculture, Food & Rural Development. Worldwide, aquacuture knowledge has dramatically improved. Now the consumer market requests farmed fish; all contributing to a bright exciting future for this wonderful food

Frank Fallwell,
Chairman
Billingsgate Fish Co.Ltd.

Business Help

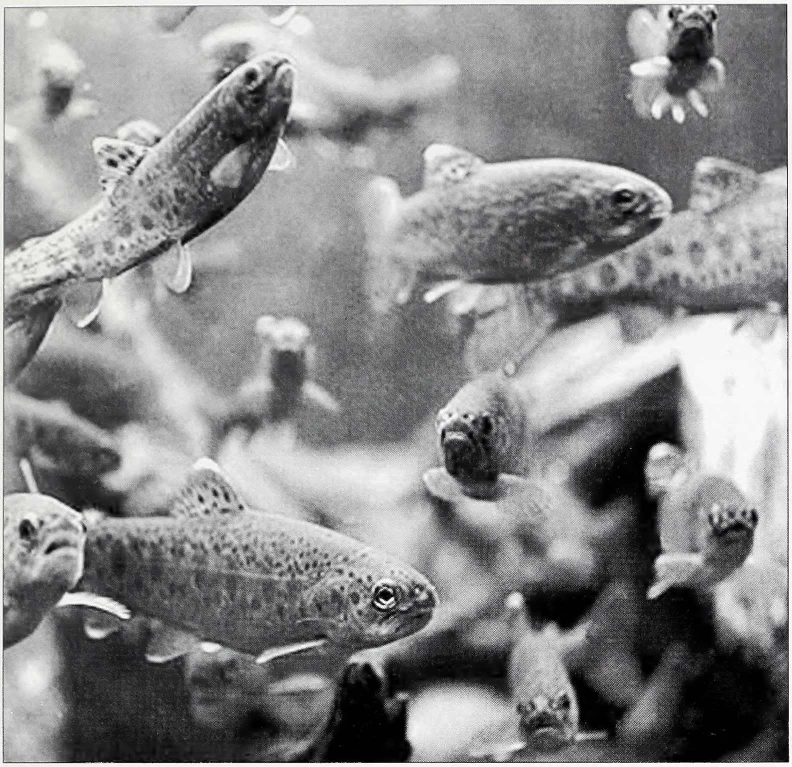
for fish Farmers

Fish farming, as an alternative source of income, continues to interest Alberta entrepreneurs. Knowing where to access information is a great first step to getting started. Rural Development Specialists (Business) with Alberta Agriculture, Food and Rural Development can help new fish farmers with business planning and existing farmers with marketing plans.

Good business planning is the first step to future business success. Rural Development Specialists (Business) can help you think through your entire operation before you invest time and money. Business planning means looking at the current situation, setting goals of where you want to be, deciding what you need to get there, estimating expenses, plus anticipating the expected revenue.

Both new and existing fish farmers need markets for their products. Will your market be in pond stocking, meat sales or U-fish opportunities? How will you determine a price or distribute your product? How will you advertise and promote your product? The answers to these questions are the beginning of your personal marketing plan. Rural Development Specialists will work with you to build a marketing plan specifically for your operation.

Call a Rural Development Specialist today, toll-free, by dialling 310-0000. Ask the operator for your nearest Rural Development Specialist (Business) with Alberta Agriculture, Food and Rural Development, District Office Business Development Specialist



Can I Import Fish for Culture?

Acquiring trout eggs or fish from Alberta suppliers requires no permit”, states Bev Larson, Alberta’s Local Fish Health Officer; “although the seller must have a valid commercial fish culture licence and the buyer must be licenced to rear fish.”

Since October 1, 1997 Alberta’s borders have been closed to imports of live (finned) salmonids, which include trout. Only egg stages can be imported. This measure was taken to reduce the risk of also importing the Whirling Disease agent with shipments of live trout.

All imports of eggs into the province require a Fish Import Permit, issued by Alberta’s designated “Local Fish Health Officer.”

SOURCES

Numerous sources for salmonid eggs are available across Canada and the USA. Many advertise in aquaculture journals and fish farming periodicals. Local Alberta fish farmers may recommend suppliers where they have purchased stock. ***If your source is outside of Alberta, an import permit will be required, an assurance that the source facility/ fish have been inspected for certain fish disease agents, states Larson.***

HOW DO I GET AN IMPORT PERMIT?

Once you have chosen a source of eggs, the supplier (consignor) must provide a current Fish Health Certificate (accompanied with lab report) to the Local Fish Health Officer. This verifies that fish stocks in the facility have been tested for specific diseases/disease agents of concern, in accordance with the Fish Health Protection Regulations. The supplier can relay this information directly to Fisheries & Wildlife Management in Edmonton, by **fax (403) 422-9559.** Known suppliers have been sent forms for this purpose. Further inquiries can be made by **calling (403) 427-7581 or 7588).**

The permit requires the consignee’s name (person requesting the eggs) and the destination address, including a current fish farm license number. Information on the number of eggs imported, shipment method & approximate date, and the port of entry are also required. The purchaser (consignee) can request the Health Certificate & Lab Report from the supplier and directly deal with Fisheries & Wildlife Management on obtaining a permit.

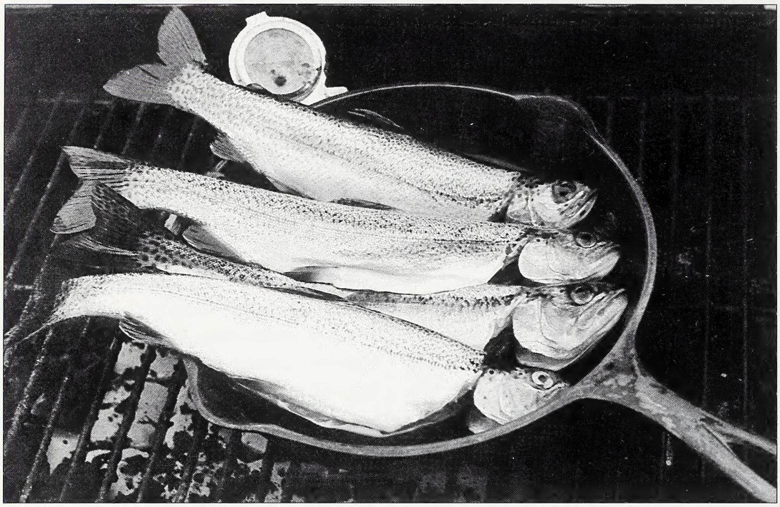
A permit is issued and signed by the Local Fish Health Officer, providing all necessary information is received and no reportable diseases/disease agents have been detected at the source facility. Allow 2-3 weeks for the permit process, says Larson particularly when health information from the source facility is unknown. A quick response is possible for facilities with up-to-date information and accessible personnel.

The fish import permit is numbered and is appropriate ONLY for that shipment. A copy of the permit must travel with the shipment of fish eggs. Within 10 days after receipt of shipment, the consignee (receiver) must sign the permit, confirming receipt, forwarding a copy to the Local Fish Health Officer.

***“Because fish eggs come from a certified source, doesn’t mean they’ll be free of all disease concerns,”* concludes Larson.**

For more information on Importing Fish into Alberta, contact Bev Larson, Local Fish Health Officer, Fisheries Management Division, Edmonton, ph. (403) 427-8288

Profile on Valley Spring Trout



... a central Alberta family farm that also raise and sell trout for the table market.

In 1996, Dan Radomske and Peggy Bayne decided to add more diversity to their already busy farm life of Purebred Gelbvieh cattle, grain, hay production and parenting. The clear spring water across the road held the key. Trout have been raised under the ice every year since 1985. The fresh water produces the tastiest fish Dan has ever caught. By expanding he could share his success with the public.

In 1997, Dan applied for a health permit to allow him to sell cleaned fish to the general public. The market would be neighbors, the local butcher shop and private sales in the Red Deer area. The importance of marketing was not new to Peggy. She has been hand making wool saddlepads for over 10 years. Little did she realize that she would now be cleaning trout every week from November to April.

"Apart from constructing the pond, our operation did not require major financial investment. The commercial focus did, however, force us to buy some equipment most pond owners don't need, like a power plant and a meat vacuum packager. What we used to call a hobby is now called supplementary income with a lot more work. In 1997, we produced 900 kg of trout. Due to unwelcome help from a mink we didn't have that many to market."

"Our commercial fish farm, near Wimbourne, has 3 dugouts and a small pond that the spring flows up into. It is fenced on about 2 acres to keep cattle out. The shallowest dugout is stocked with brook trout, as they are more tolerant of warm temperatures and lower oxygen."

"The newest dugout, also spring fed, holds smaller trout for the restaurant trade. Fingerlings in this dugout are finished for market when they reach eight ounces. We have painfully learned that growing a standard 8 ounce sized fish is difficult, since unfortunately, fish grow at different rates. We are also experimenting with 200 Arctic Char in our coldest water."

"Currently, no U-fishing is allowed in our ponds, for a couple of reasons. We do not have time to patrol and manage patrons and Doug Smith of Alta-View Trout has that type of business not far from us. We do encourage certain friends and neighbors to help us fish when we fill large orders. The fish are processed in a manner approved by the local health inspector," states Radomske.

Predators, such as Great Blue herons and mink, sometimes cause us problems. Although Great Blue Herons are regular visitors, they can be deterred by electric fencing. After some trial and error, Radomske found the right wire spacing. Two wires completely surround each pond, held out of the water by insulated re-bar. He manufactures these for other interested fish growers. The wires run about 45 cm apart, 15 cm above the water and are hooked to the electric fencer already surrounding the pastured cattle.

Although 1998 was one of the driest years on record, the fish survived well. "Aeration is a very important part of our fish operation. Depending on the time of year, we use 2 pumps with 6 air outlets," states Radomske. Dan feeds his fish only as a supplement. He also monitors air and water flows daily until winter harvest time.

In conclusion, Radomske feels there are opportunities for many folks in Alberta to have an enjoyable sideline, make a few dollars and offer top quality fresh trout "Alberta Grown"

Water and Fish In ..... Livestock Out!

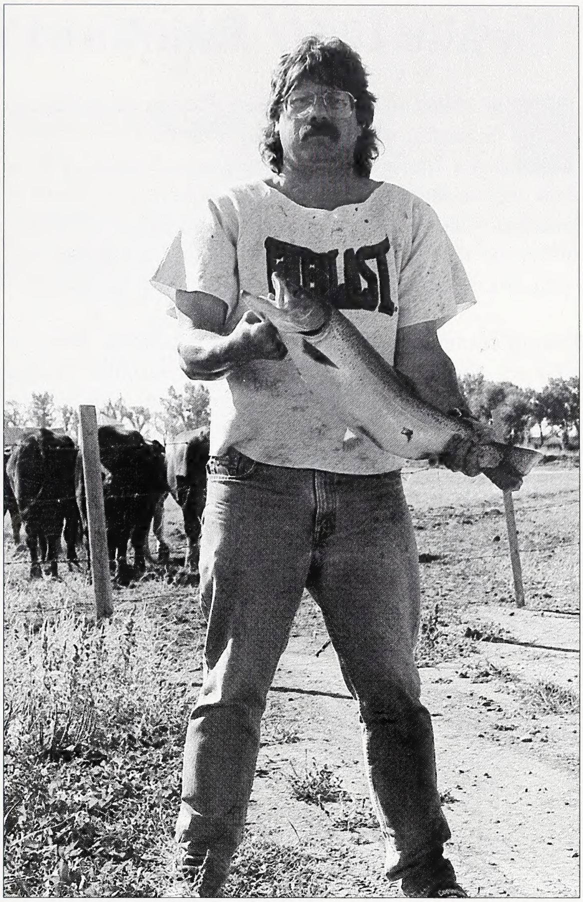
Most fish farmers are involved with more than just raising fish. The reservoirs that hold the fish are also needed for other uses, such as livestock watering. However, allowing more than fish to access your reservoir might cause water quality problems. Livestock that directly drink from dugouts/reservoirs, may be removing money from your own pocket.

Both livestock and fish need a certain quality of water to survive and thrive. Better quality water helps livestock gain more weight in less time. This results from better access to water, increased palatability, and lack of harmful bacteria and parasites. When livestock enter the water, they generally sink in the mud and defecate in the water after they drink. This leads to several problems.

First, trampling destroys the bank making for poor fish habitat. Second, soil particles become suspended in the water, providing prime habitat for bacteria and parasites such as giardia and cryptosporidium. Third, livestock exposed to mud are more prone to foot related problems. Fourth, over time, bank erosion will result in large amounts of sediment entering the reservoir which will reduce the useable capacity. Fifth, and maybe the most important problem is livestock manure. Not only is manure a harmful bacteria source (fecal coliforms) but manure is a major source of phosphorus loading.

Phosphorus is an aquatic plant fertilizer. Some plants, such as algae, provide a poor environment for fish, as they compete for the same oxygen. When algae die and decompose, it uses up oxygen and release phosphorus, which promotes more algae growth. Some species of blue-green algae produce toxins that are lethal to animals that drink the water.

Several procedures will improve water quality and prolong the life of your dugout/reservoir. The most effective method is to fence the reservoir off, preventing access to livestock. Cattle can still drink the water, but from a trough or cattle waterer. These remote sources can be filled by pump, powered with electricity, solar batteries, or wind. Look at the power source best suited to each application and how dependent you are on its reliability. Costs of remote watering livestock depend on power source, number of livestock to be watered, amount of lift from the reservoir, and distance from the reservoir.



Bill Hirsche holding a Rainbow from a pond where cattle are excluded.

A commercial electrical powered system can cost from $800 to $2500. Solar powered systems can cost from $1600 (45 cow/calf pairs) to $3000 (150 - 220 cow/calf pairs). A wind powered system can cost from $1800 up.

The idea of keeping livestock out of the water source is not new, but is becoming more widely used, due to the long term economic benefits. Good livestock watering practices will provide a better habitat for your fish, which in turn will result in happier, healthy fish. The fact that good water quality is good for more than your fish, should be enough motivation to keep only what is meant to be in your reservoir... water and fish.

For more information on designing and constructing a remote livestock watering system, contact Joe Harrington @ (403) 381-5846 or any Regional Engineering Technologist with Alberta Agriculture, Food and Rural Development District Office

“Snake Lake Rainbows” • Farmed Alberta Trout •

In 1998, John and Sandra Bjornson of Alberta Trout Growers decided to expand their rainbow trout fingerling fish farm, near Tofield. Rather than expand on-site, John started a new facility south of Bassano, Alberta, on Snake Lake, an irrigation reservoir owned by the Eastern Irrigation District. This new fish farm caters to raising fish for the table food market.

During summer operation, water flows freely from an adjacent canal into 10 meter diameter circular rearing tanks and then into Snake Lake. Water moves through the system at a rate of around 34,000 litres per minute.

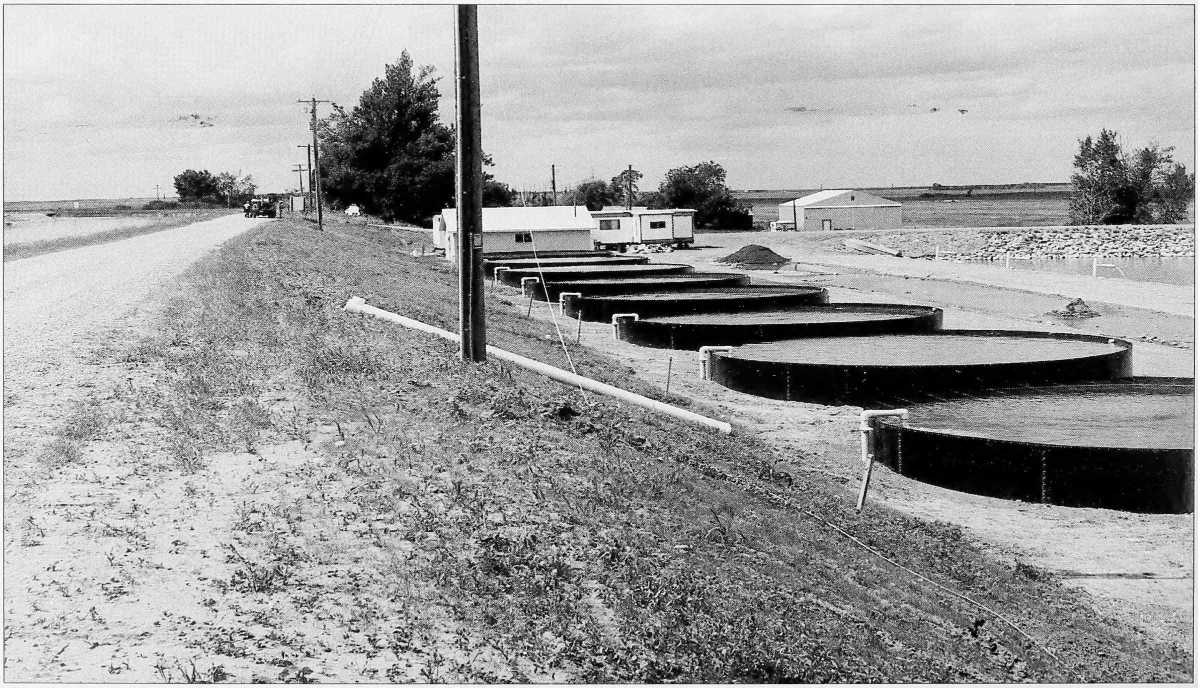
In winter months, water is pumped up from the lake at half the summer’s flow rate. Water is pumped from a depth of 12 meters. This recirculation of reservoir water allows us an extra three months of growing season, after the canal is shut down. “Not quite Idaho conditions” states John Bjornson, “but close”.

All tanks are outdoors, at the mercy of the elements. Special netting is placed over the tanks, necessary to prevent marauding birds from predating on the finned aquatic livestock.

John works between both fish facilities, which requires frequent 600 km round trips. His wife, Sam, manages the Tofield farm and his son B.J. takes care of the daily routines at Snake Lake. This year will be an interesting learning period. We’ve had water temperature problems, water pumping concerns, and a shortage of stock due to strong fingerling demand.

The Bassano facility is designed to raise 270,000 kilograms of trout annually for the table market. It takes approximately ten months to raise a trout from 5 centimeters, up to market weight of about half a kilogram (one pound). At this point, the rainbow trout will be graded and shipped to a processor in Calgary who handles the retail markets.

The Bjornson’s intentions “should all things go well ” is to start shipping table fish in late June of 1999. “At that time,” according to John, “keep your eyes peeled in the supermarket for fresh trout labelled **World Famous Bow River Rainbow**”... a made in Alberta trout



Bjornson’s Snake Lake Trout Farm, south of Bassano.

Remove That Snowfall to Avoid Winter Kill

Fish did not fare well in farm ponds during the winter of 1997. Winterkill was prevalent across the province. The ice formed on ponds at the usual time but the snow fell early and melted late. Where aeration was not provided many fish died.

So far, this winter looks good for fish survival in ponds and dugouts throughout the province. Although the water has cooled down normally, ice cover came late. Fall winds kept the pond water well mixed and aerated. Lots of oxygen was available for the decay of algae and other organisms that died and fell to the bottom over the summer. Not everything has decayed, but there was a good start while oxygen from the air was still available.

Now that ponds have frozen, watch the amount of snow on your fish pond. The depth of snow cover will play an important role in determining how well your fish survive the winter.

When there is little or no snow on the ice, sunlight can pass through the ice and into the water where it stimulates photosynthesis by the microscopic algae. Through photosynthesis the plants release oxygen into the water. When there is little or no snow on the ice photosynthesis continues and oxygen levels remain high but once the snow gets more than a few inches thick, light penetration is blocked and oxygen levels start to drop. When oxygen levels drop below 4 mg/l some fish die.

One thing you can do to keep photosynthesis going and to help your fish through the winter is to clear the snow off a strip of ice 5 m to 6 m wide along the north side of your pond. The strip you clear should be about 6 m from the shore so that the sunlight penetrates the water. For more information on aeration, contact Svat Jonas, P. Eng., AAFRD, Lethbridge at (403) 381-5870

Aquaculture Update

A number of promising developments are driving a cautious optimism in the industry as aquaculture begins to expand and diversify. Veteran and new aquaculturists are succeeding in building new or enlarged facilities. Of the current 84 commercial licence holders, 16 are new. There are presently six new commercial facilities that are in the design or construction phase and will be licenced in the future. In addition, AAFRD has licenced to date a record 2338 Recreational Licence holders in the province.

Alberta Environmental Protection (AEP) has informed us that the review of the Code of Practice for Small Fish Farms and Fish Processing Plants will begin early in the new year. CH2M Gore and Storrie were hired by AEP to review the existing Code of Practice and to make recommendations for the redraft. Chow-Seng Liu, P. Eng. from the Air Emissions Branch will coordinate the redraft of the Code. Both the Alberta Fish Farmers Association and Alberta Agriculture will be heavily involved in the process which is expected to take six to nine months. AAFRD has just recently coordinated three Risk Assessments for the introduction of new species into Alberta and forwarded the recommendations on to AEP Fisheries management. Two of the applications that have been recommended are for research licences to begin independent studies on the potential to culture Gulf White Shrimp, (in a closed water re-circulating aquaculture system); and to examine Silver Carp indoors to research the feasibility of using the species as an agent in the biological control of phytoplankton in ponds and dugouts. The third recommendation is to licence Bigmouth Buffalo Fish (with a number of conditions) for the fresh fish table market.

In closing, I would like to congratulate the Alberta Fish Farmers Association in getting their association registered and to the new interim executive headed up by John Bjornson, President, for all the effort and work they have completed in the last couple of months

Duncan Lloyd, Manager of AAFRD's Aquaculture Section in Lethbridge, Telephone (403) 381-5539.

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COURSES, PUBLICATIONS & EVENTS

Courses

Two aquaculture courses will be offered by AAFRD in conjunction with the Lethbridge Community College during the winter/spring of 1998/99.

The first course "Fish Pathology," is designed to cover basic pathology, disease diagnostic procedures and treatment of fish (cold and warm water). It will be held in Lethbridge on February 19 & 20. Common diseases experienced in aquaculture operations will be discussed. This course requires two full days to complete, and is intended for current and potential commercial fish aquaculturists.

The other course "Basic Principles of Aquaculture," will be held March 19 & 20 in Penhold. This course is targeted for individuals investigating the potential of fish culture as a commercial or recreational venture.

To pre-register or obtain more information on the Fish Pathology or Basic Principles of Aquaculture courses, contact: Eric Hutchings, Aquaculture Section Biologist, AAFRD Lethbridge at (403) 381-5574, toll free by prior dialing 310-0000.

Events

January 27 - 30 1999. Aquaculture America '99. USA National Aquaculture Conference and Exposition, held at the Tampa Convention Centre in Tampa Florida.

April 27-May 2, 1999. World Aquaculture '99 Annual international conference & exposition . Held at the Darling Harbour Convention Centre in Sydney, Australia.
Email: **worldaqua@aol.com**

July 27-30, 1999. Aquatech '99 Canada's national meeting on Aquatic Biotechnology. For more information contact Tillmann Benfey at (506) 452-6293 or Email **benfey@unb.ca.**

Publications

A number of aquaculture publications are available on short-term loan through your local AAFRD office. Most are maintained with the Aquaculture Section in Lethbridge.

Fact sheets from the AAFRD office near you include:

Biological Weed Control in Alberta using Triploid Grass Carp. Agdex 485/641-1

Freshwater Aquaculture Industry / Ag - Ventures series Agdex 485/830-1 (under review).

Editor's Notes

This bulletin on Alberta's Aquaculture Industry is intended as resource material and as a current update for people interested in aquaculture. If you would like to submit articles or provide us with input, or simply want to be placed on the mailing list, contact Eric Hutchings, the editor, in Lethbridge at (403) 381-5574 or the following address ***hutchin@agric.gov.ab.ca.***

Apparently, the Internet address for Agriculture, Food & Rural Development's **"Ropin the Web"** Home Page has been written incorrectly on both issues of Aquaculture in Alberta. This home page, which contains aquaculture information (fact sheets, fingerling suppliers lists, aquaculture links, etc.) is located at the following address ***http://www.agric.gov.ab.ca//index.html***

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